

MAMMALIAN SERINE RACEMASE

Abstract of the Disclosure

High levels of D-serine occur in mammalian brain, where it appears to be an endogenous ligand of the “glycine site” of NMDA receptors. We have purified from rat brain a soluble enzyme that catalyzes the direct racemization of L-serine to D-serine. Purified serine racemase has a molecular weight of 37 kDa and requires pyridoxal 5'-phosphate for its activity. The enzyme is highly selective toward L-serine, failing to racemize any other amino acid tested. We have also identified polynucleotide sequences that encode mammalian, including human, serine racemase. Compounds that modulate the activity of mammalian serine racemase are useful for treating conditions and diseases that involve overstimulation of NMDA receptors, such as stroke and various neurodegenerative diseases.